Evaluation Report

IMPLEMENTATION OF NATIONAL DEFENSE CENTER FOR ENVIRONMENTAL EXCELLENCE PROJECTS

Report No. D-2001-105 April 25, 2001

Office of the Inspector General
Department of Defense

Form SF298 Citation Data

Report Date *("DD MON YYYY")* 25Apr2001	**Report Type** N/A	**Dates Covered (from... to)** *("DD MON YYYY")*

Title and Subtitle Implementation of National Defense Center for Environmental Excellence Projects	**Contract or Grant Number**
	Program Element Number
Authors	**Project Number**
	Task Number
	Work Unit Number
Performing Organization Name(s) and Address(es) OAIG-AUD (ATTN: Audit Suggestions) Inspector General, Department of Defense 400 Army Navy Drive (Room 801) Arlington, VA 22202-2884	**Performing Organization Number(s)** D-2001-105
Sponsoring/Monitoring Agency Name(s) and Address(es)	**Monitoring Agency Acronym**
	Monitoring Agency Report Number(s)

Distribution/Availability Statement
Approved for public release, distribution unlimited

Supplementary Notes

Abstract
This evaluation was initiated in response to a request from the Deputy Under Secretary of Defense (Environmental Security) to review the National Defense Center for Environmental Excellence (NDCEE). This report is the third and final to be issued by the Inspector General, DoD, in accordance with the request. Congress established NDCEE in FY 1990. The NDCEE mission is to transfer environmentally acceptable materials and processes to DoD organizations and private industry, to provide training that supports the use of environmentally acceptable technologies, to support applied research and development and, where appropriate, to transfer new technologies. On March 14, 2000, the Secretary of the Army reassigned executive agency responsibility for NDCEE from the Army Materiel Command to the Assistant Secretary of the Army (Installations and Environment). The Secretary of the Army is currently restructuring the NDCEE DoD working group into an executive advisory board that consists of the Executive Agent as Chair and the Deputy Assistant Secretaries (Environment) for the three Services. The NDCEE program has received $212.2 million in congressional appropriations from FY 1990 through FY 2000. Reimbursable funding from FY 1993 through FY 2000 totaled $58.9 million.

Subject Terms

Document Classification unclassified	**Classification of SF298** unclassified
Classification of Abstract unclassified	**Limitation of Abstract** unlimited
Number of Pages 26	

Additional Copies

To obtain additional copies of this audit report, visit the Inspector General, DoD, Home Page at www.dodig.osd.mil/audit/reports or contact the Secondary Reports Distribution Unit of the Audit Followup and Technical Support Directorate at (703) 604-8937 (DSN 664-8937) or fax (703) 604-8932.

Suggestions for Future Audits

To suggest ideas for or to request future audits, contact the Audit Followup and Technical Support Directorate at (703) 604-8940 (DSN 664-8940) or fax (703) 604-8932. Ideas and requests can also be mailed to:

OAIG-AUD (ATTN: AFTS Audit Suggestions)
Inspector General, Department of Defense
400 Army Navy Drive (Room 801)
Arlington, VA 22202-4704

Defense Hotline

To report fraud, waste, or abuse, contact the Defense Hotline by calling (800) 424-9098; by sending an electronic message to Hotline@dodig.osd.mil; or by writing to the Defense Hotline, The Pentagon, Washington, DC 20301-1900. The identity of each writer and caller is fully protected.

Acronyms

CTC	Concurrent Technologies Corporation
NDCEE	National Defense Center for Environmental Excellence

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-2884

April 25, 2001

MEMORANDUM FOR DEPUTY UNDER SECREATRY FOR DEFENSE
(ENVIRONMENTAL SECURITY)
AUDITOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Evaluation Report on the Implementation of National Defense Center for Environmental Excellence Projects (Report No. D-2001-105)

We are providing this report for your information and use. We performed the evaluation in response to a request from the Deputy Under Secretary of Defense (Environmental Security) to review the National Defense Center for Environmental Excellence. This report is the third and final in a series about management of the Center. We considered management comments on a draft of this report when preparing the final report.

The comments of the Deputy Assistant Secretary of the Army (Environmental, Safety and Occupational Health) conformed to the requirements of DoD Directive 7650.3; therefore, additional comments are not required.

We appreciate the courtesies extended to the audit staff. For additional information on this report, please contact Mr. William C. Gallagher at (703) 604-9270 (DSN 664-9270) (wgallagher@dodig.osd.mil) or Mr. Benjamin A. Mehlman (703) 604-9291 (DSN 664-9291) (bmehlmen@dodig.osd.mil). See Appendix C for the report distribution. The evaluation team members are listed inside the back cover.

Thomas F. Gimble
Acting
Deputy Assistant Inspector General
for Auditing

Office of the Inspector General, DoD

Report No. D2001-105 **April 25, 2001**
(Project No. D1999CB-0068.002)

Implementation of National Defense Center for Environmental Excellence Projects

Executive Summary

Introduction. This evaluation was initiated in response to a request from the Deputy Under Secretary of Defense (Environmental Security) to review the National Defense Center for Environmental Excellence (NDCEE). This report is the third and final to be issued by the Inspector General, DoD, in accordance with the request. Congress established NDCEE in FY 1990. The NDCEE mission is to transfer environmentally acceptable materials and processes to DoD organizations and private industry, to provide training that supports the use of environmentally acceptable technologies, to support applied research and development and, where appropriate, to transfer new technologies. On March 14, 2000, the Secretary of the Army reassigned executive agency responsibility for NDCEE from the Army Materiel Command to the Assistant Secretary of the Army (Installations and Environment). The Secretary of the Army is currently restructuring the NDCEE DoD working group into an executive advisory board that consists of the Executive Agent as Chair and the Deputy Assistant Secretaries (Environment) for the three Services. The NDCEE program has received $212.2 million in congressional appropriations from FY 1990 through FY 2000. Reimbursable funding from FY 1993 through FY 2000 totaled $58.9 million.

Objectives. The overall evaluation objective was to determine the effectiveness of NDCEE in developing and disseminating advanced environmental technologies for DoD. Specifically, we evaluated the NDCEE program's effectiveness in successfully demonstrating and validating advanced technologies, transferring those technologies to appropriate DoD sites, and realizing significant benefits and return on investment to the DoD. We also evaluated the adequacy of management controls related to the evaluation objective.

Results. Although NDCEE has realized successes, program implementation can be improved. Our survey of NDCEE customers found that 83 percent reported that they were either satisfied or very satisfied with services received. However, DoD did not maximize dissemination of advanced environmental technologies from the NDCEE. Only 20 of the 63 demonstrated technologies (32 percent) were subsequently transferred to DoD sites. Demonstrated technologies were not disseminated because the DoD installations requiring the technologies did not receive sufficient funding. Also, NDCEE did not consistently provide cost/benefit analyses of technologies that it demonstrated and validated. In addition, Army and NDCEE program managers lacked meaningful performance and benefits measurement criteria to report mission results.

As a result, DoD is missing opportunities to reduce the costs and risks associated with environmental pollution and improved direction of NDCEE operations as needed. For details of the evaluation results, see the Finding section of the report.

Summary of Recommendations. We recommend that the Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health) direct the NDCEE to conduct a potential cost/benefit analysis for each technology that is recommended for use. Also, we recommend that the Deputy Assistant Secretary, in coordination with the Deputy Under Secretary of Defense (Environmental Security) and the Services, make funding available to support the transfer and use of validated and cost-effective, advanced environmental technology projects to DoD sites. In addition, we recommend that the Deputy Assistant Secretary, together with the Services, develop a process, in consultation with the DoD Executive Advisory Board for NDCEE, to identify those DoD facilities, processes, and contractors that could benefit from NDCEE-demonstrated and -validated technologies, and institute an effective technology dissemination strategy to promote their DoD wide implementation wherever suitable. We also recommend that the Deputy Assistant Secretary develop and carry out structured oversight for the management of the NDCEE program that includes specific performance measurement criteria related to the program mission.

Management Comments. The Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health) concurred with the finding and recommendations, and further agreed to use the NDCEE Executive Advisory Board to implement the recommendations of this report as appropriate. In addition, the Deputy Assistant Secretary stated that the DoD Environment, Safety and Health Technology Board Working Group, overseen by the Office of the Deputy Under Secretary of Defense (Environmental Security), should establish guidelines for implementing DoD environmental technology in accordance with the recommendations of this report. A discussion of management comments is in the Finding section of the report and the complete text is in the Management Comments section.

Evaluation Response. We agree with management comments. DoD Environmental, Safety and Occupational Health Technology Board Working Group documents state that a primary function of the Environmental, Safety and Occupational Health Technology Board is identifying and funding of proven environmental technologies. Continued efforts in this direction will improve the overall program effectiveness.

Table of Contents

Background

Establishment of the National Defense Center for Environmental Excellence (NDCEE). Public Law 101-302, "FY 1990 Supplemental Appropriations Act," provided for the establishment of the NDCEE to transfer[1] environmentally acceptable materials and processes to DoD activities and private industry. The Act also requires the NDCEE to provide training that supports the use of new environmentally acceptable technologies, support applied research and development and, where appropriate, transfer new technologies.

Executive Agent. In a March 20, 1991, memorandum, the predecessor of the Deputy Under Secretary of Defense (Environmental Security) designated the Secretary of the Army as the NDCEE executive agent, responsible for oversight of policy, budget, contracting, and other DoD concerns relating to NDCEE. On April 11, 1991, the Secretary of the Army delegated NDCEE executive agent responsibility to the Army Materiel Command. On March 14, 2000, the Secretary of the Army reassigned executive agency responsibility from the Army Materiel Command to the Assistant Secretary of the Army (Installations and Environment). The Army awarded Concurrent Technologies Corporation (CTC) a series of 5-year cost reimbursement contracts to operate and manage the NDCEE. The present 5-year contract expires in 2003. CTC is a nonprofit corporation with headquarters in Johnstown, Pennsylvania, and regional field offices throughout the United States.

NDCEE Funding. The NDCEE program was established in 1990 and has received congressional appropriations from its inception to the present. Congressional appropriations, referred to as mission-directed funding, are used to maintain NDCEE management and operations. The NDCEE program received $212.2 million in congressional appropriations from FY 1990 through FY 2000. The mission-directed funding is one of two major categories of program funding sources. The other NDCEE program-funding source is reimbursable funding. Reimbursable funding was initiated in FY 1993 to compensate NDCEE for projects initiated to meet specific requirements of the requesting customer organization. These organizations include each of the DoD Services and the Defense Logistics Agency. Reimbursable funding from FY 1993 through FY 2000 totaled $58.9 million.

NDCEE 5-Year Plan. In Conference Report 102-1015, page 178, FY 1993 Defense Appropriations Act, conferees directed the Secretary of the Army to submit by "March 15, 1993, the Army's 5-year plan for this Center," (NDCEE). The conference report resulted in a continuing 5-year reporting requirement. The current 5-year plan covers FY 1998 through FY 2003 and includes seven NDCEE goals. Two key goals are:

- Transfer environmentally acceptable technologies and insert into weapon systems and the industrial base, and

[1] We interpret "transfer" to mean "transitioned to a DoD site and in current use."

- Provide a bridge between the Science and Technology demonstration and validation[2], engineering development, and the manufacturing technology communities.

The primary focus for FY 1998 and FY 1999 was expanding NDCEE expertise over DoD industrial pollution prevention and compliance. NDCEE focused most of its technology efforts on four industrial processes: painting, metal finishing, paint stripping, and metal cleaning. The processes are typically performed in Army Depots, Naval Stations and Shipyards, and Air Force Logistical Centers. Beginning in FY 2000, the plan states that NDCEE would further develop expertise in technology transfer, while in FY 2001, NDCEE would concentrate on technology training for DoD customers.

DoD Executive Advisory Board for NDCEE. The NDCEE DoD working group was established in 1994 to address DoD environmental technology requirements and to facilitate the exchange of programmatic and technical information among DoD, other Federal agencies, industry, and academia. The working group was never chartered. It included two representatives of the Army, Navy, Air Force, Marine Corps, the Defense Logistics Agency, and non-voting representatives from the offices of the Deputy Under Secretary of Defense (Environmental Security) and the executive agent. The new executive agent is restructuring this group into an executive advisory board with three operational tiers: policy, administrative actions, and technical issues. The top tier of the new advisory board is chaired by the executive agent and includes the Deputy Assistant Secretaries (Environment) of the three Services. Completion of the restructuring is expected during 2001.

DoD Environmental Quality Safety & Occupational Health Technology Board (the Board). In February 2000, the Deputy Under Secretary of Defense (Environmental Security) established the Board to provide policy, oversight, and coordination for DoD environmental, safety, and occupational health technology programs. The Board established a working group to integrate the Service requirements, coordinate other DoD level programs, and provide information on Service implementation of technologies.

Objectives

The overall evaluation objective was to determine the effectiveness of NDCEE in developing and disseminating advanced environmental technologies for DoD. Specifically, we evaluated the NDCEE program effectiveness in successfully demonstrating and validating advanced technologies, transferring those technologies to appropriate DoD sites, and realizing significant benefits and

[2] We define "validation" as meeting the technical performance and demonstration requirements stated in the contractual task order.

return on investment to the DoD. We also evaluated the adequacy of management controls related to the evaluation objective. See Appendix A for a discussion of the evaluation scope and methodology and our review of the management control program.

Implementation of National Defense Center for Environmental Excellence Projects

Although the NDCEE program has realized some successes, program implementation can be improved. Our survey of NDCEE customers found that 83 percent reported that they were either satisfied or very satisfied with services received. However, DoD did not maximize dissemination[3] of advanced environmental technologies from the NDCEE. In addition, Army and NDCEE program managers lacked meaningful performance and benefits measurement criteria to report mission results. These conditions occurred because:

- NDCEE did not consistently provide cost/benefit analyses of technologies that it demonstrated and validated,
- The installations requiring the technologies did not receive sufficient funding, and
- The Army executive agent did not provide adequate oversight of the NDCEE program.

As a result, DoD is missing opportunities to reduce costs and risks associated with environmental pollution and improved direction of NDCEE operation was needed.

NDCEE Technology Demonstrations and Transfers

Customer[4] Satisfaction with NDCEE. We conducted a survey of 72 NDCEE customers, of which 50 replied (see Appendix A for a description of the sampling methodology used). Eighty-three percent of the customers replying reported that they were either satisfied or very satisfied with the service they received from NDCEE. We also visited 9 NDCEE customer sites to review 20 transferred technologies. (See Appendix B for a discussion of the survey and site visit results.)

Demonstration and Transfer of Technologies. NDCEE realized some successes through the transfer of technologies to DoD sites. A summary of NDCEE demonstrations and transfers is presented in the following table.

[3] We define "dissemination" to mean the transfer of a specific technology to one or more DoD sites.

[4] We define "customer" to mean installations that are recipients of NDCEE technology, including all reimbursable and congressionally directed funds.

NDCEE Technology Demonstrations and Transfers FY 1991 through FY 2000	
Demonstrations	
Completed demonstrations	63
In-process technology demonstrations (transfer decision pending)	21
Total	**84**
Transfers	
Technologies transferred to a DoD site with NDCEE demonstration	21
Technologies transferred to DoD site with no demonstration required	35
Total	**56**

How NDCEE Promotes Technology Dissemination. NDCEE promotes technology adoption at its Johnstown facility where it performs presentations, demonstrations, and validations. Some technologies are demonstrated at DoD customer sites. On occasion, DoD customers bring their own industrial items to NDCEE for validation. NDCEE also promotes dissemination of demonstrated technologies to DoD sites by providing web and hardcopy information to potential DoD users.

Technologies Demonstrated and Transferred by NDCEE. An example of an NDCEE-demonstrated and -transferred technology is the Jacksonville Naval Air Depot Automated Ultrahigh Pressure Water-Jet System Workcell. The water jet system replaced a previous acid bath technology used to clean aircraft engine parts and uses chemical-free ionized water, eliminating most hazardous waste by-products generated by the previous technology. The water jet technology cleans parts on an average of 15 minutes compared to up to a day and a half required by the previous technology. This new technology enabled the naval air depot to increase cleaning capacity while eliminating work backlogs. The life cycle economic analysis projected potential monetary benefits of $8.7 million over 15 years, with a projected payback of 0.9 years.

NDCEE Transferred Technologies with no Demonstration Required. NDCEE managers noted that technology demonstrations were not needed for 35 transferred technologies that either were demonstrated by another party or were already in use by industry. An example is the Radford Army Ammunition Plant Facility Environmental Management and Monitoring System. The system reduces work hours previously devoted to reading and recording safety instruments while enhancing plant operational safety through improved early problem recognition. NDCEE managers expected the Radford system to result in extensive labor cost reductions.

Dissemination and Analysis of NDCEE Technologies

DoD did not maximize dissemination of advanced environmental technologies from the NDCEE. Although NDCEE technology transfer activities are often successful, technologies are not being effectively disseminated to many potential DoD customers. Of the 20 technologies demonstrated and transferred by

NDCEE, only 1 technology was disseminated to multiple sites. Installation funding limitations remain the primary reason for the limited technology dissemination.

NDCEE Study of Industrial Requirements. An NDCEE 1997 study revealed that similar process requirements are present at many sites across DoD Components. NDCEE developed a comprehensive matrix of industrial processes at Army Depots, Naval Air Stations and Shipyards, and Air Force Logistics Centers. This matrix indicated that the same or very similar industrial processes are present at many weapon system maintenance sites. The study concluded that the DoD user community potentially benefiting from disseminated technologies is much greater than previously believed and that an effective technology will likely benefit other sites. By failing to reach a greater share of this potential user community, DoD is missing opportunities to realize greater monetary return on its NDCEE investment and to lower environmental risk at DoD sites.

Transfer of Demonstrated Technologies. As noted in the table on page 4, NDCEE has demonstrated 63 technologies since 1991. Only 20 of the 63 demonstrated technologies (32 percent) were subsequently transferred to DoD sites. Demonstrated technologies were not transferred because installations requiring the technology did not receive sufficient funding, technical obstacles existed, the technology failed to pass validation, and the technology or process was not yet required.

Technologies not Transferred Because of Lack of Funding. Lack of funding to pay for technology transfer and dissemination is perhaps the most difficult obstacle faced by the NDCEE program. Twenty-five percent of the respondents to our questionnaire who implemented the results of their project listed "lack of funding for capital equipment or other implementation costs" as the most significant obstacle they encountered in implementing the project results. NDCEE has no control over the funding of DoD facilities for the procurement of NDCEE environmental technologies. An example of an NDCEE-demonstrated-and-validated technology project not transferred due to lack of funding is the Mountain State Engineering Pressure-Controlled Atomization Process. The pressure-controlled atomization process is a thermal spray that might replace hard chrome electroplating technology for some applications. Although a demonstration unit was fabricated and acceptance tests were completed, funding was exhausted and the NDCEE transfer did not take place.

Study of Technical Obstacles to Technology Transfers. The NDCEE contracted with the National Academy of Sciences (National Research Council) to study and assess barriers to the transfer of pollution prevention technology related to materials processing and manufacturing. The study results should identify NDCEE problems with technology transfer to DoD Components and provide recommended actions. The report is expected in 2001.

Other Factors Inhibiting Transfers. In several cases, the demonstrated technology failed validation and did not satisfy customer requirements.

Occasionally, the needs of a client may change during the demonstration period, making the transfer no longer practical. Some technology demonstrations involve more than one client, and sometimes more than one Service. As a result, each technology will have different transfer conditions that are separately considered. In some cases, the technology may be relatively uncomplicated making it possible for a client to adopt the technology without the assistance of NDCEE. Finally, the purpose of a demonstration may be to further the development of a technology with no specific facility targeted for the transition.

NDCEE Cost/Benefit Analyses. NDCEE customers surveyed stated that the cost/benefit or returns on investment calculations were performed for only 54 percent of the technologies demonstrated and/or transferred (see Appendix B for a discussion of survey results). NDCEE managers stated that many projects did not receive a cost/benefit or return on investment study because such analyses were performed only at customer request and were separately funded. Reponses to our questionnaire indicated that, of those customers who implemented projects, 57 percent did not realize the estimated savings. Cost-effectiveness is often a critical element for potential technology users in assessing the merits of technology adoption. Regardless of customer requirements for a technology project, we believe that a cost/benefit calculation should always be included in the overall project analysis, if it is relevant.

Environmental Cost Analysis Methodology. The environmental cost analysis methodology is a model developed by Lybrand Coopers L.L.P. and sponsored by the Office of the Deputy Under Secretary of Defense (Environmental Security). The model provides a consistent quantification and evaluation of costs and benefits of technology investments. We believe that NDCEE should adopt a standard methodology, such as an environmental cost analysis, for technology demonstration and validation. An accurate cost/benefit and return on investment analysis will provide a basis for comparison to other potential sites.

Technology Dissemination Methodology. Although NDCEE and DoD had some success in transferring technologies to DoD sites, NDCEE lacked an effective technology dissemination methodology. Current dissemination activities are important and should continue to be offered, but they should focus on transferring technologies to all potential DoD customers. The previously mentioned NDCEE industrial requirements study documents that NDCEE had not reached many potential customers for these technologies. NDCEE needs to supplement its current transfer activities to identify and pursue all potential customers for technologies already demonstrated and validated by NDCEE. The executive agent, through the Executive Advisory Board, should assure that all potential customers consider acquiring these technologies.

NDCEE Performance Measures

Army and NDCEE program managers lacked meaningful performance metrics to quantify the NDCEE mission accomplishment because the Army executive agent did not provide adequate oversight of the NDCEE program. As a result,

opportunities for enhancing the benefits of the NDCEE program to DoD were not fully exploited. Recent executive agent changes may help to correct this situation.

Performance Metric Criteria. We did not identify any specific policy requirements or performance measurement criteria for the NDCEE program. However, we consider performance and outcome criteria and metrics to be fundamental to proper program management and oversight. Performance metrics may be impractical in the early phases of research and development; however, the NDCEE program is dealing with late stage, fully developed technologies, most of which are already in practical and beneficial use in private industry. Therefore, we believe that performance and outcome metrics are not only practical to NDCEE, but also essential to competent program management.

Army Oversight of NDCEE Program. The Army had not established formal criteria on how to measure NDCEE mission accomplishments or to identify NDCEE benefits. The Secretary of the Army initially delegated NDCEE executive agent responsibility to the Army Materiel Command. We interviewed members of the Army Materiel Command on how they performed their NDCEE oversight responsibilities. We concluded that the Army Materiel Command performed only limited formal oversight of the NDCEE program because the Command had no policy for NDCEE program oversight and had not established criteria to evaluate NDCEE mission accomplishments or to identify and measure NDCEE benefits. This inadequate oversight and lack of performance measurement criteria were serious program weaknesses; however, the Army has since taken steps to address program oversight.

Army Changes in Program Management. As a result of this and previous Inspector General, DoD, reports on NDCEE, the Army made several changes to the NDCEE program. The Secretary of the Army transferred NDCEE executive agent responsibility to the Assistant Secretary of the Army (Installations and Environment) from the Army Materiel Command. The new executive agent delegated program management authority to the Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health). Effective November 7, 2000, the Assistant Secretary transferred Procurement Contracting Officer authority to Defense Supply Services-Washington from the Tank-Automotive and Armaments Command. The new executive agent coordinated a complete review of the mission and structure of the executive advisory process. The new structure's primary challenge is to enable funding for all DoD sites that wish to acquire and use NDCEE-demonstrated technologies.

Improvements Needed in NDCEE Operations. Although customers, in response to our questionnaire, gave NDCEE very favorable ratings, improvements could be made to maximize the benefits of NDCEE to the DoD. NDCEE needs to:

- Develop a more effective methodology for disseminating technologies to DoD customers in implementing the results of the 1997 study of industrial requirements,

- Provide a cost/benefit analysis for each project or technology, where appropriate, and

- Create and use management performance measurement criteria.

Implementation of the above should result in an improved NDCEE process for identifying and soliciting potential DoD customers to benefit from NDCEE-demonstrated technologies.

Summary

Congress created NDCEE in 1990 to demonstrate, validate, and transfer to DoD organizations environmentally acceptable materials and processes with the capability of reducing the cost and risk associated with environmental pollution. NDCEE customers in the DoD Components were generally satisfied with the work and products they received from NDCEE. NDCEE reported that it had demonstrated 63 technologies since 1991; however, only 20 of these technologies had been transferred to DoD sites and only 1 technology had been disseminated to more than one site. A 1997 NDCEE study concluded that there are many additional sites and industrial processes within DoD that might also benefit from the demonstrated technologies. By not maximizing the transfer and use of these advanced industrial processes wherever they are suitable within DoD, the DoD is not taking full advantage of the opportunities to reduce the significant cost and risk of environmental pollution. In addition, the program lacks performance measurement criteria. Recent executive agent organizational changes may help to correct the deficiencies.

Management Comments on the Finding

Management Comments. The Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health) concurred with the finding.

Recommendations and Management Comments

We recommend that the Deputy Assistant Secretary of the Army (Environment Safety and Occupational Health):

1. Direct the National Defense Center for Environmental Excellence to conduct a potential cost/benefit analysis for each technology recommended for use.

2. In coordination with the Deputy Under Secretary of Defense (Environmental Security) and the Services, make funding available to support the transfer and use of validated and cost-effective, advanced environmental technology projects to DoD sites.

3. Together with the Services:

a. Develop a process in consultation with the DoD Executive Advisory Board for NDCEE to identify those DoD facilities, processes and contractors that could benefit from National Defense Center for Environmental Excellence-demonstrated and -validated technologies, and

b. Institute an effective technology dissemination strategy to promote their DoD-wide implementation wherever suitable.

4. Develop and carry out structured oversight for the management of the National Defense Center for Environmental Excellence program that includes specific performance measurement criteria related to the program mission.

Management Comments. The Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health) concurred with Recommendations 1. through 4. The Deputy Assistant Secretary stated that his office will use the NDCEE Executive Advisory Board to implement the recommendations. In addition, the Deputy Assistant Secretary stated that the DoD Environment, Safety and Health Technology Board Working Group, overseen by the Office of the Deputy Under Secretary of Defense (Environmental Security), should establish guidelines for implementing DoD environmental technology in accordance with the recommendations of this report.

Evaluation Response. We agree with management comments. DoD Environmental, Safety and Occupational Health Technology Board Working Group documents state that a primary function of the Environmental, Safety and Occupational Health Technology Board is identifying and funding implementation of proven environmental technologies. Continued efforts in this direction will improve the overall program effectiveness.

Appendix A. Evaluation Process

Scope and Methodology

We evaluated NDCEE technology projects to determine whether NDCEE was successfully meeting its mission to demonstrate, validate, and transfer technology projects to appropriate DoD sites while realizing significant benefits and return on investment to DoD. We assessed NDCEE mission accomplishment through three methods. We gathered a list of all successfully demonstrated technologies from NDCEE relating to technology demonstrations, demonstration outcomes, transfer of technologies to DoD sites, and documented technology benefits to the DoD up to June 1, 2000. We also gathered information through a questionnaire provided to a randomly selected statistical sample of 72 NDCEE DoD customers for 60 NDCEE study, planning, and technology projects. In addition, we carried out a series of nine site visits and interviews to DoD Component locations that have extensively used NDCEE services. Three sites were selected from each military Service. See Appendix B for further discussion of questionnaire and site review scope and methodology, and a summary of results of the reviews.

DoD-Wide Corporate Level Government Performance and Results Act Goals. In response to the Government Performance and Results Act, the Secretary of Defense annually establishes DoD-wide corporate level goals, subordinate performance goals, and performance measures. This report pertains to achievement of the following goal and subordinate performance goal.

DoD Corporate Level Goal 2: Prepare now for an uncertain future by pursuing a focused modernization effort that maintains U.S. qualitative superiority in key warfighting capabilities. Transform the force by exploiting the Revolution in Military Affairs and reengineer the Department to achieve a 21st century infrastructure. (01-DoD-2) **FY 2001 Subordinate Performance Goal 2.3:** Streamline the DoD infrastructure by redesigning the Department's support structure and pursuing business practice reforms. **(01-DoD-2.3)**

DoD Functional Area Reform Goals. Most DoD functional areas have also established performance improvement reform objectives and goals. This report pertains to achievement of the following functional area objective and goal:

> **Environmental Functional Area. Objective:** Achieve compliance with applicable Executive orders, and Federal, State, and inter-state, regional, and local statutory and regulatory environmental requirements
> **Goal:** Number of new, open, unresolved, and closed enforcement actions to environmental statutes. **(ENV-2.1)**

General Accounting Office High-Risk Area. The General Accounting Office has identified several high-risk areas in the DoD. This report provides coverage of the Defense Infrastructure high-risk area.

Use of Computer-Processed Data. We did not use computer-processed data for this evaluation.

Evaluation Type, Dates, and Standards. We performed this program evaluation from August 2000 through January 2001 according to standards implemented by the Inspector General, DoD. We included tests of management controls considered necessary.

Contacts During the Evaluation. We visited or contacted individuals and organizations within DoD. Further details are available upon request.

Management Control Program Review

DoD Directive 5010.38, "Management Control (MC) Program," August 26, 1996, and DoD Instruction 5010.40, "Management Control (MC) Program Procedures," August 28, 1996, requires DoD organizations to implement a comprehensive system of management controls that provide reasonable assurance that programs are operating as intended and to evaluate the adequacy of the controls.

Scope of the Review of the Management Control Program. We reviewed the adequacy of the management controls of the Army management and oversight of the NDCEE. We specifically reviewed the effectiveness of the executive agent in the management control process and the annual statement of assurance for the NDCEE program in accordance with DoD Instruction 5010.40.

Adequacy of Management Controls. NDCEE management controls were inadequate because the Army Executive Agent did not provide adequate oversight. The Army improved program oversight through transfer of executive agency responsibilities to the Office of the Assistant Secretary of the Army (Installations and Environment) as recommended in Inspector General, DoD, Report No. D-2000-127, "Program Management of the Materials and Processes Partnership for Pollution Prevention," May 22, 2000. Implementation of Recommendation 4. by the Deputy Assistant Secretary of the Army (Environmental Safety and Occupational Health) will address remaining identified weaknesses.

Prior Coverage

We identified four Inspector General, DoD, reports conducted on the subject during the last 5 years.

Inspector General, DoD

Inspector General, DoD, Report No. D-2001-6-002, "Report on Quality Control Review of Grant Thornton LLP, for Office of Management and Budget Circular No. A-133 Audit Report of Concurrent Technologies Corporation Fiscal Year Ended June 30, 1998," February 23, 2001.

Inspector General, DoD, Report No. D-2000-188, "Contract Management for the National Defense Center for Environmental Excellence," September 14, 2000.

Inspector General, DoD, Report No. D-2000-127, "Program Management of the Materials and Processes Partnership for Pollution Prevention," May 22, 2000.

Inspector General, DoD, Report No. 99-249, "Implementation of Innovative Technology for DoD Environmental Cleanup Projects," September 9, 1999.

Appendix B. Inspector General, DoD, Survey and Technology Site Visits

Questionnaire of NDCEE Clients

In order to obtain a more detailed and representative picture of NDCEE customer experience, we mailed questionnaires concerning 60 NDCEE projects to NDCEE clients at 72 DoD Component sites. The 60 NDCEE projects, valued at $72.2 million, were statistically sampled projects from a universe of 141 study, planning, and technology demonstration projects. We received 50 questionnaire responses (69 percent) of the 72 sent. Twenty-four questionnaire responses dealt with NDCEE technology demonstration projects, and the remaining 26 responses involved NDCEE plans or studies.

Questionnaire Results. We asked 16 questions covering three areas of interest:

- why customers used NDCEE,
- customer satisfaction with NDCEE, and
- project cost avoidance and/or return on investment.

Why Customers Used NDCEE. Questionnaire responses indicated that ease and convenience of contracting with NDCEE for the needed technology was the primary reason (43 percent) that DoD customers sought technical assistance. However, only 18 percent of respondents considered NDCEE to be the best qualified or the only qualified source for the transferred technology. Eleven percent of respondents said NDCEE was chosen because they had no other option. When asked what was the primary reason for performing the technology project, 32 percent of the respondents indicated to "achieve compliance" and 22 percent sought to "compare alternatives."

NDCEE Uniqueness. Although customers responded very positively when asked about work delivered by NDCEE, they did not consider NDCEE to be particularly unique. For instance, 69 percent of questionnaire respondents stated that they would have likely found and adopted the transferred technology even if NDCEE did not exist.

Types of NDCEE Support. In follow-up field visits to some of these respondents, we were told that they knew about the technology before their relationship to NDCEE. However, customers still stated that NDCEE provided valuable support and was instrumental in the final project success. Surprisingly, only 10 percent of respondents stated that NDCEE "fulfilled a new or more effective technology," which is the general mission of NDCEE.

Customer Satisfaction with NDCEE. Respondents indicted satisfaction with NDCEE. For example, 83 percent said they were either "satisfied" or "very satisfied" with the work performed by NDCEE, and 74 percent said they were

either “likely” or "very likely" to recommend NDCEE to others. In addition, 89 percent rated products delivered by NDCEE as “satisfactory” or better when compared to other DoD environmental programs or Service Centers.

Project Cost Avoidance and Return on Investment. Responses to NDCEE cost-avoidance estimates were mixed. Fifty-four percent of the respondents stated that NDCEE provided a cost/benefit estimate and a time frame, while 46 percent stated that NDCEE did not provide such an estimate. Where cost avoidance estimates were performed, 57 percent of the respondents stated that project savings did not materialize. Respondents stated that projected savings did not materialize either because the project was not implemented on a full-time basis, or because the project was implemented but estimated results were not achieved. Several customer responses indicated that achieving environmental compliance was the principal reason for the project, with cost benefit being a secondary consideration. [5]

DoD Site Visits

We reviewed 27 projects at 9 NDCEE customer sites that extensively used NDCEE services. We selected three sites from each military Service. We interviewed technical personnel responsible for the NDCEE projects: technology operators, senior managers, and others associated with the project outcomes. We sought to learn how the technologies were installed at the sites, the exact role of NDCEE in the process, the quality of the work and products delivered by NDCEE, and the subsequent experience of the site following installation of the technology. We also observed the technologies in operation. Most of the technologies observed dealt with removing or applying coatings on weapon system parts.

Visit Results. The site visits confirmed most of the questionnaire data. Of the 24 technologies reviewed, 20 technologies were in full-time use. Two technologies were installed, tried, and eventually abandoned because they did not work satisfactorily[6], and one technology was still in field-testing. One technology in full-time use had been disseminated to two of the sites visited. NDCEE customers were generally satisfied with the work and products delivered by NDCEE. Interviews confirmed that the principal concern of customers was compliance with environmental requirements in order not to interrupt critical operations. Customers stated that 12 of the technologies helped meet an environmental requirement, while 10 projects documented cost benefits, and 9 did not. Two locations told us that they use other technical contractors in addition to NDCEE and choose the best-qualified contractor for the particular task. Two other sites currently use NDCEE exclusively.

[5] Of the 60 projects in our sample, 26 projects consisted of plans, studies or environmental management improvements for which cost avoidance calculations were not applicable.

[6] Advanced Immersion System at the Corpus Christi Army Depot, Texas, and Wastewater Technology Testbed at the Puget Sound Naval Shipyard, Washington.

Appendix C. Report Distribution

Office of the Secretary of Defense

Under Secretary of Defense (Comptroller)
  Deputy Comptroller (Program/Budget)
  Deputy Chief Financial Officer
Deputy Under Secretary of Defense (Environmental Security)

Department of the Army

Assistant Secretary of the Army (Installations and Environment)
  Deputy Assistant Secretary of the Army (Environment Safety and Occupational Health)
Commander, Tank-Automotive and Armaments Command, Army Research and Development Center
Auditor General, Department of the Army
Inspector General, Department of the Army

Department of the Navy

Naval Inspector General
Auditor General, Department of the Navy
Deputy Assistant Secretary of the Navy (Environment and Safety)
Superintendent Naval Post Graduate School

Department of the Air Force

Assistant Secretary of the Air Force (Financial Management and Comptroller)
Auditor General, Department of the Air Force

Other Defense Organizations

Director, Defense Contract Audit Agency
Director, Defense Logistics Agency
Inspector General, Defense Intelligence Agency
Director, National Security Agency
Inspector General, National Security Agency
Director, Acker Library, Defense Systems Management College
Director, Defense Contract Management Agency
Director, Audit Control Office, Defense Finance and Accounting Service

Non-Defense Federal Organizations

Office of Management and Budget
National Security Division

Congressional Committees and Subcommittees, Chairman and Ranking Minority Member

Senate Committee on Appropriations
Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
House Committee on Appropriations
House Committee on Armed Services
House Subcommittee on Defense, Committee on Appropriations
House Subcommittee on Government Efficiency, Financial Management, and Intergovernmental Relations
House Subcommittee on National Security, Veterans Affairs, and International Relations, Committee on Government Reform
House Subcommittee on Technology and Procurement Policy, Committee on Government Reform

Department of the Army Comments

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
INSTALLATIONS AND ENVIRONMENT
110 ARMY PENTAGON
WASHINGTON DC 20310-0110
March 29, 2001

MEMORANDUM FOR OFFICE OF THE INSPECTOR GENERAL, DEPARTMENT OF DEFENSE (Mr. William C. Gallagher)

SUBJECT: Executive Agent Response to Draft OIG Report No. D-1999CB-0068.002, Proposed Evaluation Report "Implementation of the National Defense Center for Environmental Excellence," January 26, 2001

I have reviewed the subject report evaluating the past effectiveness of the National Defense Center for Environmental Excellence (NDCEE) and concur with the findings and recommendations. As the Executive Agent, I will utilize the NDCEE Executive Advisory Board, approved by the Deputy Under Secretary of Defense (Environmental Security), to implement the recommendations of this report as appropriate.

In addition, I believe the DOD Environment, Safety and Health Technology Board Working Group, overseen by the Office of the Deputy Under Secretary of Defense for Environmental Security, should corporately establish guidelines for the implementation of DOD environmental technology in accordance with the recommendations of this report.

My Point of contact for this action is Mr. Joseph Vallone, (703) 614-4474.

Raymond J. Fatz
Deputy Assistant Secretary of the Army
(Environment, Safety and Occupational Health)
OASA(I&E)

cf:
ODUSD(ES)

Printed on Recycled Paper

Evaluation Team Members

The Contract Management Directorate, Office of the Assistant Inspector General for Auditing, DoD, prepared this report. Personnel of the Office of the Inspector General, DoD, who contributed to the report are listed below.

Paul J. Granetto
William C. Gallagher
Benjamin A. Mehlman
LTC George P. Marquardt
Peter J. Larson
Vanessa S. Adams
Karen A. Ulatowski
Robert B. France